RAVALLI NATIONAL WILDLIFE REFUGE

Stevensville, Montana

N A R R A T I V E R E P O R T

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P e r s o n n e l

George A. Devan.....	Refuge Manager
Ellen H. Anderson.....	Clerk-Stenographer
Thomas B. Davies.....	Foreman I
Otto Wolf.....	Laborer, W.A.E.
Larry Powell.....	Laborer
Edward A. Schreckendgust..	Laborer, Youth Opportunity Corps

U. S. Department of the Interior

Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife

C O N T E N T S

RAVALLI NATIONAL WILDLIFE REFUGE

1966

I. GENERAL

A. Weather

Weather conditions are a relative thing: Comparing our weather with what is normal for this area, or with the remainder of Montana, we could collectively call this past year's weather as exceptionally mild, pleasant and dry.

Snow conditions of last winter were light. Wind was at a minimum. Extreme cold periods were not prolonged. And weeks of overcast or river bottom fog were of nominal amounts.

The spring was "early" allowing some farming operations to commence by the third week in April. Soils warmed quickly in the spring and a few well spaced rain showers helped seed germination and plant growth.

The summer was warm and abnormally dry; pleasant to man but quite a retardant to plant and crop growth.

Weather was extremely mild from September to the end of the year. There was a shortage of both precipitation and sunshine. Even during the end of December, thawing conditions were experienced almost every day.

The year's weather summary is given below:

	Temperatures			Precip-	
Month	High	Low	Ave.	itation Totals	Remarks
Jan.	48	1	28.4	1.90	17th warmest in 75 years
Feb.	46	6	29.8	.48	.52 precip. less than normal
Mar.	74	0	35.7	.84	average
April	73	12	43.7	.15	precip. .63 under normal
May	91	24	55.1	.40	precip. 1.12 less than normal
June	89	30	57.1	2.21	.48 above normal precip.
July	94	39	65.8	.69	.24 below normal precip.
Aug.	97	33	63.3	.89	.20 above normal precip.
Sept.	88	28	59.4	.50	.42 under normal precip.
Oct.	75	17	43.8	.57	.37 under normal precip.
Nov.	62	11	34.6	.70	unusually dry
Dec.	54	9	30.6	.57	Mostly cloudy; little precip.

B. Habitat Conditions

1. Water

Some of the older residents of the Bitterroot Valley advocate that this was the driest summer they have experienced for the past 35 years. The neighboring mountain snowpack was extremely low, based on a ten year average. Spring, summer and fall rains were also extremely sparse.

The Bitterroot River, which is the west boundary of the refuge, was abnormally shallow from June to the end of the year.

Surprisingly enough, even in a dry year such as this, the refuge had ample water to conduct most of its activities. Much of our water is received from springs, artesians and seeps that originate on the refuge. These sources are probably charged by the leaching and waste waters of irrigation projects on the benches to the east of the refuge, as well as natural ground waters. Those benches were still irrigated this past season though the ranchers manipulated their water in a more frugal manner.

We have a 400 inch water right on the Bitterroot River. It is diverted from the river at a point east of the golf course. The water has been used for grassland irrigating on tract 12. Through a court decree all water rights past the 25th were terminated for the month of August. This was an emergency court action during this drouth year. Our water right is past the 25th. As a consequence, tract 12 could not be properly irrigated and permittees' cattle had to be removed at an earlier date than normal. However, we took advantage of the dry conditions and did considerable structure, canal and irrigation ditch restoration related to the river water right. The system has been entirely rejuvenated. We will be able to divert, manipulate and more fully utilize that water source in the future.

Part III of this report mentions in more detail the construction of five major waterfowl ponds at the south end of the refuge. The drouth conditions and low water tables of this year assisted us on that construction. Conditions were dry enough to make earth moving most efficient. After completion of the project in early September, we did have ample water to fill the ponds, offering some excellent fall and early winter habitat to waterfowl and related shore birds.

In summary we can say that the Bitterroot Valley experienced a severe water shortage during 1966. We had ample water for most of our refuge activities. And, we took advantage of the dry conditions by completing some of our earth construction at a more economical cost.

2. Food and Cover

Aquatic food was rated as very good in all of our wetland habitat. Watercress, monkey flower and related plants were so abundant on the north portion of tract 19 that some had to be removed mechanically from the creek to avoid flooding. The exception to our abundance ofaquatic plants was in the newly constructed ponds at the south end of the refuge. These were first filled with water in early September.

Many of our meadows are subirrigated and the drouth did not affect plant growth too drastically until later in the growing season. Upland pastures such as on tract 12 were extremely "burned" and some refuge livestock had to be removed from the area as much as six weeks earlier than is normal.

A moderately good berry and seed crop developed on the browse plants of the refuge. Wildlife species relying on those plants for food source did not experience any undue hardship.

When we consider cover we are chiefly concerned with the ground nesting birds, such as certain pond ducks, shore birds, song and gallinaceous birds. Ample cover was retained from last season to serve these species for their nesting requirements. And, we curtailed our land use grazing operations to the point that these species had ample cover for the remainder of the year.

In summary, we would classify our food and cover for wildlife requirements as good this year.

PART II. WILDLIFE

A. Migratory Birds

Ducks. Warm water sloughs of the refuge support a wintering population of waterfowl, primarily mallards. During the January to April period of 1965, we had a total use days of slightly over 30,000. During that same period this year, our total use days increased to over 86,000. The added use was caused by a combination of initial wetland habitat development, enforced land use policy, grain farming program and relatively mild winter weather. The mild winter evidently caused many of these mallards to terminate their migration here in the valley.

Our duck production has started to increase this past year at an impressive rate. A year ago we had a production of 165 ducks as opposed to 780 this year. The increase is attributed to our initial habitat restoration and area protection. Only limited

development had been done by the nesting season but the results gave us encouragement as to what can be expected after full development of our habitat.

Ducks utilizing the refuge for the September-December period were impressive. A year ago for that period we had total days use of slightly over 41,000 with the peak number of 800 birds. This year our total days use was 421,407 with a peak number of 6,000 birds. Mild weather and considerable habitat development this past season have caused this highly desired population increase.

Our new ponds attracted migrating ruddy ducks this fall. About 500 birds used the area during September.

Geese. Goose use and production has increased slightly this year. Although not spectacular, impressive results from our limited habitat development have occurred. Currently we are talking in terms of only a few dozen geese when referring to this refuge, but indications thus far make us believe that proportionate results can be expected from future development.

Several snow geese used the refuge for a seven week period this fall. These birds were quite an attraction to the local bird watching group and quite an incentive for the refuge waterfowl hunters.

Swan. Some whistling swan use was noted on proposed refuge tract number 27. That particular tract, which contains some excellent natural waterfowl habitat, is not included in our censusing nor reflected on our NR-1 forms due to the hostility of the potential vendor.

Grebes. Our newly constructed ponds attracted an assortment of grebes during September and early October. Eared, pied-billed, least, horned and even a red-necked grebe were observed.

Shore Birds. Other than for a few sandpipers, killdeer, and common snipe, shore birds have been relatively rare in this part of the valley in the past. Our development of this year has been able to attract a great variety of these species this past fall, however.

Four major ponds were completed and filled in September. The ponds were diked on two sides. The sloping soil sides of the ponds as well as the diking itself attracted a variety of shore bird species that caused considerable excitement to us as well as to the many bird watchers in this locality. Some of the observed species that are unusual for this locality are avocet, black tern, both yellowlegs, sanderling and dowitcher. Full details of the observations are given on the NR1-A form for the September to December period.

Doves. Mourning dove betterment can be considered as somewhat a by-product of our effort. We do have a small population of them that nest on the area and we support some during fall migration. But currently none of our management is directed specifically toward their welfare. About 20 pairs nested on the area and peak population was about 300 during July.

Great Blue Heron. Two known blue heron rookeries occurred in the immediate area of the refuge. One is located north of Bell Crossing, near Victor. The other is located due north of refuge tract 25 on the west side of the river. We have been assuming that the second rookery was just slightly off the refuge. (We do own a small piece of isolated land west of the river.) We resurveyed the corners of the land this fall and found that the rookery was on the refuge by about two rods. This was of interest from two points; blue herons are now recorded as nesting on the refuge, and if the rookery should be abandoned in future times, it might serve as a nesting site for osprey. The ospreys mentioned in Part E of this section currently nest about one-half mile east of the heron rookery.

B. Upland Game Birds

There has been no appreciable change in the valley's population of ring-necked pheasants this year. Their numbers have been extremely low for the best part of a decade. As mentioned in other narrative reports, the limited population is probably due to a complexity of many factors. These include the radical change of land status and agricultural practices, use of pesticides, more intensive hunting pressure and increased use of bird dogs, and the population being reduced to a very low level in recent years with a prolonged hunting season and the legal taking of hens.

There are only a few dozen pheasants using the refuge at this time. We are managing some of our habitat for the dual welfare of pheasants and other birds. We will probably note some population increase in future years, but the refuge population can never attain great proportions due to its limited acreage.

C. Big Game Animals

About ten white-tailed deer use the refuge. Reproduction is estimated at about four fawn. One deer was lost this year due to predation. Signs would indicate that the kill was made by a pack of marauding dogs. Roaming dog packs from Stevensville are relatively common on the river bottom and probably contribute to a considerable amount of harassment to deer and other forms of wildlife found along the valley bottom close to town.

Due to the drouth conditions of this past summer, wild berry crops on the surrounding mountains were extremely sparse. It appears that this was the main reason that a considerable number of black bear moved from the mountains down into the valley during late summer and early fall. Bears were commonly viewed throughout the valley, and one was even seen on the refuge.

D. Fur Animals, Predators, Rodents and Other Mammals

Muskrat activity was noted in most of our sloughs. Their populations are quite low and currently we still value our entire population of this fur bearer for marsh management.

Limited beaver activity was noted during the year. Their signs were seen on tract 21 west and tract 11. A small problem developed with beaver on tract 21 west. There they attempted to dam up the Ox Bow slough. Their dams were repeatedly cleaned out in an attempt to discourage them and have them relocate elsewhere on our waterways. Beaver activity in the right areas of our waterways could be quite an assistance to our management program.

Red fox and striped skunk and semi-feral cats and dogs are what we consider our predators.

The skunk population appeared to be down considerably from a year ago. Only a few dozen animals were actually seen.

Red fox are relatively abundant on the refuge and throughout the valley. We know of active dens on tracts 11, 19 and 21.

Feral house cats are seen commonly on the refuge and throughout the entire river bottom of the valley.

The refuge is located three miles from Stevensville. Wandering packs of dogs radiate out from town in all directions. It is not uncommon to see three to six dogs wandering along the river on the west side of the refuge.

All the predators mentioned above are of concern in managing a waterfowl refuge. However, currently, neither the situations nor their status are critical, demanding immediate control practices.

Mouse damage occurred on some of the ornamental shrub plantings at the refuge work center last winter. The damage was not severe. Precautionary measures have been taken this year by painting the stems of those plants with petroleum products so as to discourage the rodents. No other rodent activities worthy of mention were noted during the year.

Signs of raccoon are still seen rather frequently along the river bottom. Their population is low and present no problem to us. They are still considered as a "novelty" animal in this locality.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

Sparrow hawks were our most common raptor again this year. About ten pairs nested on the refuge. A few remained on the refuge all of last winter. Red-tailed hawks were occasionally seen throughout the year and two pairs nested on the refuge; one nest was located west of the golf course, and one in proposed tract 27.

A Swainson's hawk was observed during our Christmas Bird Count a year ago and again this December, a rather unusual winter resident for this locality. A few Swainson's used the refuge early this spring and one pair was known to have nested on tract 25.

An active osprey nest is located about two miles north of the refuge. Young have been raised in it for at least the last three years. A second pair of osprey built a new nest this year on proposed tract number 27. About early May the new nest was taken over by Canada geese. (This particular nest is located in a cottonwood snag about 45 feet off the ground.) The evicted pair of osprey relocated their nest about one-half mile southwest of the former one. (This is still on proposed tract 27.) That pair of osprey were successful in raising three young to flight age. The Canada geese mentioned abandoned their nest about the third week in May. We believe that perhaps this is the pair of geese that nested on the old river channel, tract 25, late in May, and successfully reared a brood.

An occasional bald and golden eagle was seen during the entire year. It is strongly suspicioned that golden eagles nest somewhere in the mountains adjacent to the valley.

Nesting activities of resident horned owls occurred early in February on tract 11. A slight buildup in horned owl population was noted in late October, probably birds migrating through the area.

An observation was made of a snowy owl on refuge tract 20 in December. This arctic visitor is a rare bird for this location. We understand that Ninepipes Refuge, about 70 miles north of us, observed several snowies this fall also. There probably is some migration phenomenon that occurred this fall with that species.

A limited number of crows were seen on the refuge during most of the year. Peak population of about 100 birds was noted during September, probably a migrating group. No known nesting occurred on the refuge.

We had an opportunity to view three ravens on the refuge this fall. These were evidently migrants.

Nothing unusual to report on magpies. Average refuge population is still about 100 birds. No increased nesting activity was noted this past spring.

F. Other Birds

We have been collecting intensive check list data on all birds since the area was first manned in 1964. The information has been compiled in a list and has been submitted for publication. One hundred sixty species are known to have used the refuge during the past two and a half years. Our submitted bird check list will be subject to revision in the future, as any check list is, we know. However, in the meantime it will serve as a valuable tool for collecting further data and will be of great assistance to the many bird watchers of this locality.

Quite a few new bird species were recorded during 1966. The majority of those new observations were attributed to the completion and filling of four major waterfowl ponds. Some of these new observations were ruddy duck, canvasback, redhead, several grebes, avocets, sanderling, both yellowlegs, dowitcher and water pippit. The most interesting new aboreal birds this year were the black billed cuckoo and pileated woodpecker. The western bluebird was also observed.

The Stevensville bird watching group assisted on three organized counts on the refuge this year. The first one was a spring count conducted in late May. The second was the mid summer count taken in August. The Christmas count was made on December 27.

G. Fish

Nothing unusual to report on fish for this year.

H. Reptiles Nothing to report.

I. Disease

Serious outbreaks of rabies were reported in many parts of Montana this past summer. Skunks have been the main carrier of the disease. Though the Bitterroot Valley has a relatively high skunk population, no disease outbreaks were reported.

A comment of interest on tularemia: The Public Health Service administers the Rocky Mountain Laboratory in Hamilton, Montana, 20 miles south of the refuge. We made inquiries to Dr. Fritz Bell of the laboratory this past fall as to his opinion why muskrat and beaver populations were decimated so heavily about seven years ago.

He believes that water was the conveying factor of tularemia. Due to water usage and re-usage, for irrigation purposes, it was logical that the disease did spread valley-wise. He advocated that the original source of the disease was subject to speculation.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

The photo section of this report pictorially shows our main accomplishments under physical development for this year. We refer the reader to review those photos.

In abstract, we constructed three major impoundments on refuge tract 21, two major impoundments on tract 19, and did repair of an existing one and the start of two other major impoundments on tract 11. Restoration of ditches and waterways was done to some extent on all refuge tracts. The Bass Crossing structure was rebuilt and the Bass pond was rehabilitated and restored.

Buildings surplus to our needs were surveyed on several tracts. Other buildings that we are retaining were repaired as needed and painted. Nine miles of fence was either replaced or intensively repaired. Two truck-loading ramps were constructed. Continued cleanup and policing of debris and accumulated trash was done to some extent on every tract we have acquired. Refuge tract 11 came under our ownership this year. Restoration and development of that tract commenced as well as the initiation of a grazing and share-cropping program.

It was a busy field season. We felt that much was accomplished for the dollar, for the man-hour, and above all, for our wildlife objectives.

B. Plantings.

Barley was planted, under a sharecropping arrangement, on tracts 11, 19 and 21. A total of 228 acres was seeded. Twenty-seven acres were sacrificed during earth diking projects on tracts 19 and 21. The government's share was 715 bushels harvested and 23 acres left standing for waterfowl food.

Limited ornamental planting was done by the two refuge residences and the work center. Bushes and fruit trees used for that purpose were salvaged from tract 13.

C. Collections and Receipts.

We received 600 pounds of white dutch clover seed transferred to us from Kootenai Refuge. The seed will be used this coming spring for pasture restoration and soil stabilization.

D. Control of Vegetation

Assistance was secured from the Ravalli County Weed Control Board in helping spray forty acres of refuge land as pest plant control. The specifics of that experiment are reported on form NR-12. The percentage of plant kill was quite low, probably due to our light application rate and the drouth conditions experienced this summer.

Limited mechanical weed control by cutting was done on portions of tracts 13 and 19. Scotch thistle is abundant on certain soils of those tracts. The plant probably invaded and took over certain soils following prolonged excessive grazing before establishment of the refuge. We feel that if we mechanically combat that plant pest on those certain spots for several years, the grasses will once again become dominant.

Limited spraying was done by sharecroppers on tracts 19 and 21 to combat mustard infestation in their barley fields. 2-4-D was applied with good results.

E. Planned Burning

The only burning that we conducted was incidental burning during some of our irrigation ditch cleaning and of debris and slash disposal.

F. Fires

This has been an extremely dry year but no fires occurred on the refuge. Surprisingly, no serious fires occurred anywhere in the valley nor on Forest Service lands in the adjacent mountains. We were just all lucky.

Any summer burning done in the valley must be done under permit issued by the local rural fire department. This regulation is in effect from May 15 to September 15. Fire conditions were so extreme during August of this year that no permits were issued for any burning other than of a minor nature.

IV. RESOURCE MANAGEMENT

A. Grazing

Refuge grazing commenced May 24th and terminated between August and December, depending on the specific tract. All livestock was removed at an earlier date than is normal due to the drouth conditions experienced this season. Tract 12 was most seriously effected by the drouth.

Through the efforts of the permittee of tract 12, a temporary electrical fence was constructed across the northern corner of tract 19. The permittee was allowed two weeks of grazing on a fee basis of that slough grass area. This was done experimentally to see if we could utilize livestock to help remove surplus rank vegetation and open up some of the waterfowl habitat in that section. The experiment worked quite satisfactorily, both to the permittee and to our management objective.

Tract 11 came under our ownership this year. A permit for 65 head of cattle was issued for that tract.

B. Haying None done this year.

C. Fur Harvest None requested nor done this year.

D. Timber Removal

No commercial timber removal done. The only timber cut was some limited timber stand improvement or where trees were a hazard to structures or in the line of new fence construction.

E. Commercial Fishing Not applicable.

F. Other Uses

The potato cellar on tract 11 was rented during 1966 under a special use permit. An extension of the permit will also be issued through May 1967. At that time the earth and pole structure will be removed and the land leveled in preparation for impounding the site for waterfowl habitat development.

The beehives formerly located on tract 13 have been relocated to the south end of tract 21. This move was in agreement with the apiarist and was necessary for our initial cleanup and development of tract 13.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report

Very little has been inaugurated in this aspect of our program. Most of our efforts are still being directed toward physical development and restoration of the area.

A series of nesting islands were constructed in connection with the new pond development. The islands are simply earth pushups done with a dozer at an average cost of $11.50 each.

Experimentally, the tops of the pushups were capped differently. Some of the islands had sod pushed on top. Some were seeded with domestic grasses and clover. Others were covered with broken hay bales and still others were prepared with a combination of loose hay and a discarded vehicle tire. The experiment is quite simple; all we are attempting to do is to see if there is one of these preparations that is preferred by nesting waterfowl in this locality.

Sixteen wood duck houses were constructed and erected at choice locations scattered throughout the refuge. Six of these houses were made of lumber using the more or less standard pattern employed in parts of Region 3. The remaining ten houses were commercial ones purchased as a prefab kit from a supply house in Iowa. The commercial units are of galvanized sheet metal and look very similar to small rockets. We altered the commercial houses to a certain extent, mainly by camouflage painting the exterior, by adding a wire ramp from the floor of the nest to the exit hole, and by drilling side holes into the cylinder to allow more air circulation. Three of the "home made" wooden boxes were utilized by wood duck hens. One of the metal "rockets" was also used to raise a brood.

Many of the smaller timbered ponds on the refuge are conducive to nesting wood ducks. Our objective in using the artificial nesting boxes is simply to expand and increase their nesting activities. A total of 31 broods of wood ducks were known to be raised on the refuge this year.

Sites have been prepared on tracts 11, 12, 19 and 20 for limited shelterbelt plantings next spring. We will employ such seedlings as honeysuckle, Russian olive and sand cherry in an attempt to increase song bird use on certain portions of those tracts.

A series of bird houses were constructed during week ends and installed near quarters No. 2. We were able to attract several nesting species this year. They were house wren, white-breasted nuthatch, violet-green swallow, and that pest, the starling. Both mountain and western bluebirds showed interest in the houses, but none used them for nesting.

VI. PUBLIC RELATIONS

A. Recreational Uses

We must mention in this report the recent publication and release of our station's Conceptual Plan. Perhaps this section of the report is as proper as any for those comments.

Conceptual plans have been released for many of our new areas. The plan is a brochure outlining how the refuge was established, its responsibilities, the future plan and direction, and the anticipated benefit to the resource, the general public and the local economy. The plan is written in simple language, is relatively concise and well illustrated with photographs. It is distributed to influential and sincerely interested individuals.

We felt that the distribution of our published plan has been one of our most instrumental public relation tools. The recipient of a copy of the plan can actually see our program objectives stated in simple language and illustrated. They seem to feel that this plan is something sincere and tangible, as compared to verbal discussions or explanations offered to them in the past, or to rumors that they have heard.

The drafting and publishing of conceptual plans is probably a relatively expensive investment. However, it is an investment, and one that has offered good returns.

Our NR-6 form, Public Relations, for this calendar year, showed the following breakdown of refuge visits: hunting 1330, fishing 2,000, and miscellaneous 1778. This is compared with 342, 2000 and 370 a year ago.

Our miscellaneous visits, in order of most use, were bird watching, school children groups, school faculty groups and youth groups. Ravalli is a small refuge but is one that has already worked into this locality's recreational planning to a good extent during the past two years. We are really just at the start of our development at this new station. However, by choice many of the school groups prefer to come out to the refuge for an orientated tour, as to choose anywhere else in the valley for a field trip. We find this enthusiasm of the school groups rather rewarding for, as mentioned, in this early stage in our development we actually have very little to offer these groups other than a basic tour and discussion of management principles with a few natural history sidelights.

We are programmed for a combination office and visitors' center during the next few years. This new building on the refuge will be a great asset, not only to our more efficient administration of the area, but also by offering more effective and organized

recreational and educational public relations contacts and programs. Currently our limited office space is located in town.

Ravalli Refuge was designated as a Golden Eagle recreation area this year. We met the public as best we could. However, we had very little to offer the public during the summer season from an organized recreation standpoint.

We have started development of an organized recreation area this season. It will consist of a family picnic area and also be used as a meeting spot for outdoor groups and river access point. It is located on tract 21 in the extreme southwest corner of the refuge. The approach is a trail from the county road to the Bitterroot River. Further work and refinement will be done on the project during this coming field season. Several photos in the back section of this report give an index of what has been done so far.

B. Refuge Visitors

Our office is currently located in the town of Stevensville. Office visitors are quite common daily. Bird watchers, hunters, fishermen and other nature orientated recreationists stop in frequently to inquire about topics of their interests.

A county road runs through the refuge. Many visitors use that road year round for driving and sight seeing, numbering probably 6,000 to 7,000 total individuals.

A bound office ledger is maintained of all official visitors to the station. This log, a permanent station file, showed 120 official visits the past year.

C. Refuge Participation

Our largest participation was with bird watchers and garden clubs. We are called upon frequently to give guided tours of the refuge, collaborate on bird counts in the area and to give talks and discussion to the groups. Bird watching has been important public relations and educational aspect of the refuge.

We conducted six guided tours for school groups during the year. These were the 5th, 6th, 8th, 9th, and 11th and 12th grade classes. Also two faculty groups. Thirteen movie showings were given at schools also.

D. Hunting

Approximately 38 percent of the refuge was open to public hunting this year. A map follows this section depicting what area was opened to hunting.

Waterfowl. An extremely liberal waterfowl hunting season was granted to Western Montana, which is a portion of the Pacific Flyway. Waterfowl season commenced October 8 and terminated January 5. Daily and possession limits were six ducks, of which not more than two could be wood ducks. Mallards are the main bird bagged in this locality. The goose season was the same as for ducks with daily and possession limit of six geese with no more than two Canada geese or their subspecies.

Most hunters experienced an excellent season. Warm weather made the area conducive to intensive bird use. Normal freeze-ups to the north concentrated birds here. Hunting pressure was considered heavy.

Mallards were the main duck taken by hunters. A few hunters on the refuge were lucky enough to bag Canada geese. Also two known snow geese were collected.

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Pheasants. Pheasant season/from October 30 through November 27, with a daily bag limit of three cocks. The refuge pheasant population, as well as the entire valley, is at an extremely low level and has been so for several years.

Hunting pressure was rated as moderate. At least a few hunters used the area pursuing pheasants every day of the season. However, a hunter cannot harvest birds if they are not there. An estimated 14 pheasants were taken by hunters during the season.

Archery, White-tailed deer hunting. The archery season along the river bottoms of the valley, including the refuge, was September 25 to November 27. Hunter use of this recreation in this locality was extremely limited. Only a few hunters were checked, and no known deer were taken.

E. Violations

No violators were apprehended on the refuge this season. We know that there are violations in this part of the valley. Late shooting is heard rather commonly and, by the sound, we would assume that there are some unplugged guns in use. It must be remembered, however, that this part of the valley is a grid of roads with a wide scattering of waterfowl habitat through it all. Hunters are not consistent where they hunt and it is almost

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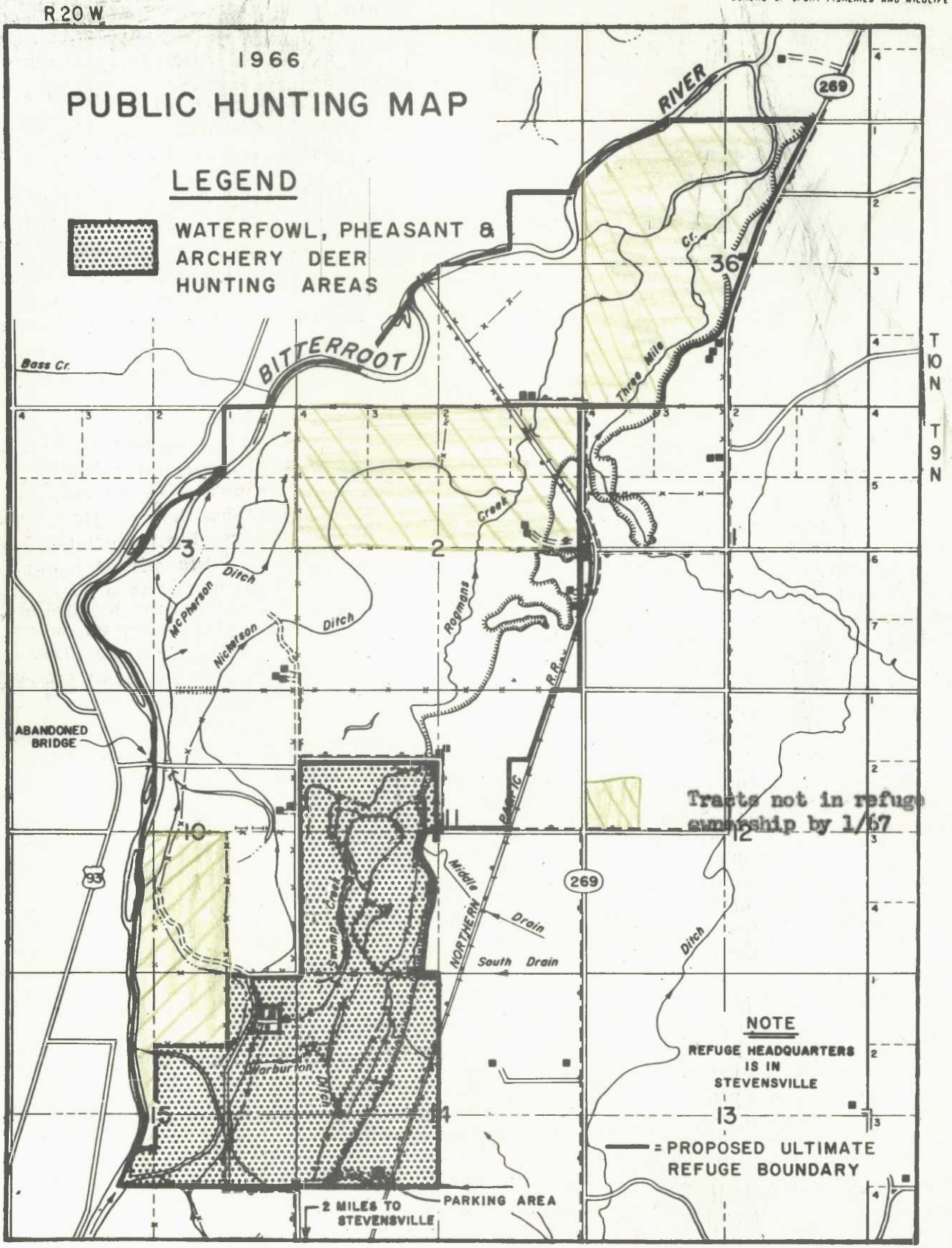
RAVALLI COUNTY, MONTANA

UNITED STATES
DEPARTMENT OF THE INTERIOR

U S FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE



COMPILED IN THE BRANCH OF ENGINEERING FROM SURVEYS BY AERIAL PHOTOGRAPHY, F&W.S., B.L.M., U.S.G.S., AND MONTANA STATE HIGHWAY DEPARTMENT.

PORTLAND, OREGON AUGUST 1965

PRINCIPAL MERIDIAN

Scale 0 10 20 40 60 80 CHAINS
0 1/8 1/4 1/2 3/4 MILES

TOWNSHIP DIAGRAM

MEAN DECLINATION 1962

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impossible for us to take on the responsibility of patrolling this whole part of the valley. We concentrate on the refuge, of course. Probably through that checking and patrolling we have discouraged refuge violations.

VII. OTHER ITEMS

A. Items of Interest

Our report a year ago mentioned a pending lawsuit between the Northern Pacific Railroad and several Hamilton attorneys, the attorneys being the plaintiffs. The suit is against the railroad for riprapping the river on private land with auto car bodies. The land in question is adjacent to the refuge. That particular suit is scheculed to be tried in court this spring.

Otto Wolf, who has been employed by us during the past two seasons as temporary laborer, has been reassigned to the position as Laborer WAE.

PHOTO SECTION

The following 39 photos illustrate the highlights of our year's accomplishments and activities. A greater number of photos were used than normally. However, we felt that the pictures more fully describe what we want to tell of this new refuge. Also, the pictures will serve as a permanent visual record for the future.

photos taken by the mgr.

This year fencing and cleanup of debris occurred to some extent on every tract we own.

Tract 25, July. NR 66-1

Along with fencing, proper posting, sign erection and irrigation ditch restoration was done.

Tract 21, south, May. NR 66-2

Land Use Planning and administering took considerable O.& M. efforts during the year. This consisted of grazing, share cropping, aparian activities and even potato cellar rental.

NR 66-3. June, Tract 12
NR 66-4. July, Tract 21
NR 66-5. Sept., Tract 11

NR 66-6
Tract 12, Sept. '65

NR 66-7
Tract 12, Nov. '66

Considerable time and effort was spent in further cleaning up our many sets of old farm buildings and non-usable structures. Extensive cleanup was done on tracts 11, 12, 13 and 25.

The before and after picture shows one of these accomplishments. This salvaged and repaired building is now a compliment to the area. It is used for equipment and material storage.

Our first major construction was done on tracts 19 and 21. Collected water sources were impounded in four ponds. The area in this photo is now all under water.

The project was a vital one. Some of our prime habitat was expanded. It is a portion of the public hunting area. And the accomplishments are easily viewed by the public from the county road.

Pond #4 was built with minimum fill. The culverts were set along the creek flow line.

NR 66-8, 9, 10, Tracts 19 and 21. July.

(MORE)

This dependable flow of warm water from Spring (Rogman) Creek is what we have impounded.

Culverts and flashboard risers were set "dry" in the field with the use of a level and rented drag-line for ponds 1, 2 and 3

Side diking was done with our little TD14 and a rented D-8 dozer

NR-66-11, 12, 13. Aug.

This is pond #2, looking south, with full crest. Thirty-two "push ups" were made in the four ponds before flooding. These will serve as nesting islands.

We had waterfowl use on the ponds from the day they were first flooded. Food source is not too abundant as yet but some is available. The push ups serve as loafing sites.

Quite a few species of shore birds that are rare or unusual to the valley used the ponds this fall. These avocets pictured caused quite a bit of excitement with local bird watching groups.

NR 66-14, 15, 16.
Tracts 19, 21, Sept.

We got a fair start at installing an organized recreation area on the refuge.

NR 66-17. Tract 21 West, Sept.

This is the start of the one-half mile scenic access trail across the Ox Bow slough. This part of the trail also serves to enlarge some of our wood duck habitat and allows us to manipulate the Ox Bow slough waters.

NR 66-18. Tract 21 West, Sept.

The trail leads to the Bitterroot River bank. Purpose of the area will be to afford the public river access for fishing, boating, etc. A small picnic area will be placed in the trees as funds become available, and will serve family picnic, bird watching and school groups.

This is the former decayed and silted-in Bass Crossing structure.

NR 66-19. Tract 13, July.

Before restoration we were deprived of utilizing efficiently over 400" of Bitterroot River water rights, as well as waste water from the Grube slough.

NR 66-20. West of
Proposed Tract 18. July

The entire unit was rebuilt with pressure treated timbers, fresh cement and a workable flashboard arrangement. The silt was used in the core of the side dikes.

NR 66-21. Tract 13, August.

River cobblestone, salvaged broken concrete and sacks of dry, 5 part sand/1 cement were used to crib and form the structure.

The finished unit is neat, efficien and reasonable in construction cost Now we can efficiently divert over 400" of water to be used for pastur irrigation and wildlife habitat on tract 12 and portions of tracts 11 and 13.

Also, an excellent waterfowl pond was created behind the structure. We'll bet that wood duck will nest on it in 1967.

NR 66-22, 23, 24. Tract 13, Aug.-Sept.

NR 66-25
Tract 12, July

The northwest portion of tract 12 along the Bitterroot River is our most serious erosion problem. Note the broken sod. During the past ten seasons the entire river channel has switched its full width to the east. In 1955, the bank was where the gravel bar is shown in the right of the picture. This exceptionally good piece of land is being whittled away more during every spring river flooding.

No money has been available to combat this serious problem. So --

NR 66-26
Tract 12, Dec.

we're experimenting. We salvaged some wolf trees from a clearing operation, dragged them to the site, arranged them in "bouquets," cabled them together and to a buried log "dead man," and pushed them over the bank. Our principle being that the branches will hold the trees off shore and the entire "bouquet" will act as a jetty to collect washed gravel in the spring and to cause the current to re-cut its former channel to the west. If the experiment works, we got the job done for a penny on the dollar. If it doesn't work, at least we created some excellent fish habitat.

NR 66-27
Tract 12, Aug.

We took advantage of the low water table during this dry year and economically cleaned out many choked and plugged sloughs. During normal water years this particular slough will maintain itself with sub-ground water.

NR 66-28
Tract 12, Dec.

This slough has been rejuvenated also. It is spring fed by warm water. A small dike and spillway across the slough created a nice pond. It also served as a good base for some of our new interior fence. Mallards find the pond quite attractive. We have also installed a wood duck house here.

NR 66-29
Tract 11, April

Tract #11 has been purchased and came under our management this calendar year. The picture shows the main portion of the tract. It's wildlife habitat potentials are excellent. Every form of wildlife common to the refuge use this area to some extent.

NR 66-30
Tract 11, April

Three and a half miles of decayed and non functional interior fence was removed. We built a truck access trail through the area for administration. A dike road had to be built over the sub irrigated grounds and a riser placed in the creek. (The top picture shows a panorama of this trail.)

NR 66-31. Tract 11
Aug. Looking west

Part of the trail had to be draglined due to the abundance of ground water close to the surface.

NR 66-32. Tract 11
Dec. Looking south

Using the new trail, we can now administer the land for grazing and farming, maintenance, patrolling and censusing. Above all, we created about 30 added acres of marsh and open water. Over 4,000 mallards congregated in this development from October through December.

Our total visitor use has increased over 100% during the past year. In addition to hunter and fisherman use, we have had increased requests by both faculty and children school groups, youth groups, many bird watchers, and even organized artist groups.

NR 66-33, 34
Tract 21, Sept. Tract 11, July

NR 66-35, 36
Tract 12, May. Tract 13, June

NR 66-37
Tract 19, Dec.

Hunter-use of the refuge increased over 100% from a year ago. To help us gather hunter statistics, two volunteer registration stands were installed at critical locations.

Bitterroot River
December
NR 66-38

Heavy hunting pressure was received on all waters of the open area. Our river access trail also helped hunters get better utilization of that habitat.

Photo taken along the new public recreation trail, southwest corner of refuge.

Three accomplishments have been met: access, water detention and aesthetic enhancement.

NR 66-39
Tract 21, Sept.

SIGNATURE PAGE

Submitted by:

_____
(Signature)

Refuge Manager
(title)

Date: January 18, 1967

Approved, Regional Office:

Date: MAR 7 1967

(Signature)

John D. Findlay
Associate Regional Director
(Title)

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE RAVALLI MONTHS OF January Thru April, 1966

(1) Species	1/2	1/9	1/16	1/23	1/30 (2)	2/6	2/13	2/20	2/27	3/6
	Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	12	10		10	10		14			
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other TOTAL	12	10		10	10		14			
Ducks:										
Mallard	390	400	600	400	400	900	400	400	600	1200
Black										
Gadwall										20
Baldpate	40	40	40	40	40		20			50
Pintail										
Green-winged teal						20	20			
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other TOTAL	430	440	640	440	440	920	440	400	600	1270
Hooded merganser						4	8	10		10
Common merganser						4	6	6		20
Coot:										

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE RAVALLI

MONTHS OF January Thru April, 19 66

(1) Species	Weeks of reporting period: 11 (3/18)	12 (3/20)	13 (3/27)	14 (4/3)	(2) 15 (4/10)	16 (4/17)	17 (4/24)	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	(4) Production: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada			12	12	12	6	6		728		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
TOTAL			12	12	12	6	6		728		
Other											
Ducks:											
Mallard	1200	900	700	500	400	300	200		69,230		
Black											
Gadwall	20	50	90	20	20	20	20		1,540		
Baldpate	50	50	150	100	100	50	40		5,670		
Pintail				50	50	50	20		1,190		
Green-winged teal	20	20	100	100	30	30	30		2,590		
Blue-winged teal	50	100	150	100	50	50	40		3,780		
Cinnamon teal		10	10	40	40				700		
Shoveler					20	40	6		462		
Wood		15	15	30	40	40	40		1,260		
Redhead					4				28		
Ring-necked											
Canvasback											
Scaup											
Goldeneye					10	10			140		
Bufflehead					10	10			140		
Ruddy											
Other											
TOTAL	1340	1145	1175	940	774	600	396		86,730		
Hooded merganser	10	10	10	10	10	10	10		714		
Common merganser	10	10	10		4		4		518		
Coot:			50	50	50	40	40		1,610		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	--		
Geese	728	14	
Ducks	86,730	1340	
Coots	1,610	50	

SUMMARY

Principal feeding areas sloughs, ponds, stubble grain fields.

Principal nesting areas

Reported by C. A. Devan, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	8	3/28	50	4/9	20	still present		100, transient
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	3/12	4	4/9	4 transient			4, transient
Duck hawk	last period							
Horned owl	10 present from		20	Feb.	still present			20
Magpie	resident, about 100							
Raven	2	2/10	12	3/12	12	3/12		12
Crow	present from last per.		150	3/12	20	still present		200
Sparrow hawk	1	Jan. 9	25	3/12	20 "	"		50
Marsh hawk	1	Jan. 18	10	March	8 "	"		15
Red-tailed hawk	3 present	fr.last per.	6	"	4 "	"		6
Swainson's hawk	2 "	" "	" 4	"	2 "	"		8
Osprey	2	3/12	2		2 "	"		2

Reported by.....
G. A. Devan, Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ravalli Months of January thru April 1966

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great blue heron	10 present from last period		12	4/10	6 still present					20, transient
Eared grebe	2	3/19	7	4/10	2 still present					10, transient
II. Shorebirds, Gulls and Terns:										
Killdeer	20 present from last period		50	4/19	20 still present					50, transient
Wilson's snipe	20 "	"	60	4/19	30 "	"				60, transient
California gull	4	4/19	4	4/19	1	4/29				10, transient
Spotted sandpiper	11	3/19	14	4/10	14	4/10				20, transient

(Note: Due to the small acreage of this station most bird species, other than nesters, move off and on the area in irregular patterns.)

(over)

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Ravalli Months of January Thru April, 1966

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring necked pheasants	Brush, grass, agricultural	25			1M/3F				70	Birds appeared to have wintered well. Sex ratio on the refuge appears slightly altered from last fall. Probably due to influences of populations adjacent to refuge.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Ravalli Year ending April 30, 1966

(1) Species	(2) Density		(3) Removals						(4) Disposition of Furs						(5)
									Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator* Control	For Re-stocking	For Re-search		Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Total Population
Mink	Marsh 600 acres	25													25
Muskrat	Marsh 600 acres	6	— none —						— none —						100
Striped skunk	Grass, brush 2200 A.	55													40
Red fox	" " "	185													12
Yellow-bellied marmot	" " "	110													20
Red squirrel	Timber 700 acres	10													70
Columbian ground squirrel	Grass 1200 acres	12													100
Raccoon	Riverbottom and backwater 100 A.	7													15

* List removals by Predator Animal Hunter

REMARKS:

Acreage has increased from a year ago due to the acquisition of two further small tracts.
No beaver or badger, or their signs, observed this past year.

Reported by _____ Refuge Manager

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

INTERIOR--PORTLAND, OREGON

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE RAVALLI MONTHS OF May Thru August, 1966

(1) Species	5/1	5/8	5/15	5/22	5/29(2)	6/5	6/12	6/19	6/26	7/3
	Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	6	10	6	6	6	22	8	8		
Cackling										
Brant										
White-fronted										
Snow										
Blue										
~~Other~~ TOTAL	6	10	6	6	6	22	8	8		
Ducks:										
Mallard	100	100	100	100	100	200	100	100	150	200
Black										
Gadwall	20	70	25	25	20	20	20	20	45	45
Baldpate	40	20	20	20	20	50	100	100	135	135
Pintail	20	40	20							
Green-winged teal	30	50	100	20	20	50	50	50	125	200
Blue-winged teal	40	40	40	40	40	100	100	100	200	275
Cinnamon teal		40	60	40	40	150	150	150	200	260
Shoveler	6	20								
Wood	40	80	100	100	110	125	200	285	285	280
Redhead										
Ring-necked		2								
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
~~Ruddy~~ TOTAL	296	462	465	345	350	695	720	805	1140	1395
~~Other~~ Hooded Merganser	10	10	15	15	15	15	75	100	100	75
Common Merganser	6	6	6	6	6	13	20	30	30	30
TOTAL	16	16	21	21	21	28	95	130	130	105
Coot:	40	40	40	40	40	40	40	50	50	75

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE RAVALLI MONTHS OF May Thru August, 1966

(1) Species	7/10 (11)	7/17 (12)	7/24 (13)	7/31 (14)	(2) 8/7 (15)	8/14 (16)	8/21 (17)	8/28 (18)	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
	Weeks of reporting period										
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada									504	3	15
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other TOTAL									504	3	15
Ducks:											
Mallard	200	200	200	250	300	400	300	450	24,850	17	100
Black											
Gadwall	45	45	40	40	50	70	70	70	5,180	4	25
Baldpate	135	100	100	100	100	50	50	50	9,275	5	35
Pintail									560		
Green-winged teal	200	200	200	200	100	100	100	100	13,265	22	150
Blue-winged teal	275	275	300	300	250	300	250	250	22,225	20	175
Cinnamon teal	260	260	300	300	100	100	150	150	18,970	14	110
Shoveler									182		
Wood	280	280	200	200	200	200	200	200	23,555	31	185
Redhead											
Ring-necked									14		
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy TOTAL	1395	1360	1340	1390	1100	1220	1120	1270	118,076	113	780
Hooded merganser	75	75	40	40	40	30	30	30	5,590	12	100
Common merganser	10	10	5	5	20			10	1,431	2	20
TOTAL	85	85	45	45	60	30	30	40	7,021	14	120
Coot:	75	75	75	50	75	75	100	100	7,560	12	100

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	--	--	--
*Geese	504	22	15
Ducks	118,076	300	780
Coots	7,560	100	100
Mergansers	7,021	100	120

SUMMARY

Principal feeding areas: Sloughs and potholes.

Principal nesting areas: Swamp and Slough Creeks, Ox Bow Slough

Reported by: G. A. Devan

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

(1)	(2)		(3)		(4)		(5)		(6)
III. Doves and Pigeons:									
Mourning dove	20	from last per.	300	July	Still present		20	160	300
White-winged dove									
*									
IV. Predaceous Birds:									
Golden eagle	2	May	7	Aug.	Still present				8 transients
Duck hawk									
Horned owl	10	estimated resident							15
Magpie	100	from last per.	150	July	Still present		10	50	150
Raven									
Crow	20	" " "	50	June	20 still	present	5	25	150
Bald eagle	1	5/7	2	6/20	2	6/20	-	-	2
Red tailed hawk	4	from last per.	14	July	6	8/31	2	10	14
Swainson's hawk	2	" " "	5	July	5	8/20	1	3	5
Sparrow hawk	20	" " "	60	Aug.	Still present		10	40	150
Marsh hawk	8	" " "	10	June	2	8/20	-	-	10 transient
Osprey	2	" " "	5	Aug.	5 still	present	*		5 transient

Reported by G. A. Devan

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

*Two active osprey nests verified along river north of refuge. One on proposed tract 27, one near Antrim lookout road.

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ravalli Months of May thru August, 1966

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great blue heron	6 present from last period		12	Aug.	Still present (rookery located off refuge)					20 transient
Eared grebe	2 "	"	4	5/3	4	5/3				4
II. Shorebirds, Gulls and Terns:										
Killdeer	20 present from last period		150	July	Still present			30	90	150
Wilson's snipe	30 "	"	250	July	"	"		50 est.	150	250
California gull	2	5/4	(up to 15 transients noted along river in Aug.)							
Spotted sandpiper	1	5/12	12	July still present				?	20 est.	50
Virginia rail	2	5/12	30	July still present				3	18	30
Northern phalarope	2	5/12	10	June	2	6/8				
Wilson's phalarope	4	5/12	30	July	1	8/15		4	20	30

(over)

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Ravalli For 12-month period ending August 31, 1966

Reported by G. A. Devan Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	Acreage	(3) Use-days		(4) Breeding Population	(5) Production
One unit, all	Crops	300	Ducks	246,267	206	780
of currently	Upland	1100	Geese	2,226	6	15
acquired refuge	Marsh	140	Swans	--	--	--
	Water	160	Coots	11,795	24	100
	Total	1700	Total	260,288	236	895
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ravalli Months of May thru August, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring necked pheasants	Brush, grass, agricultural, 1800 acres	90	3	15	1M/2F				30	Some apparent movement off of the refuge late in spring and nest predation.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1750
Form NR-1
(Rev. March 1953)

*Ponds 2, 3 & 4 filled during this week

WATERFOWL

REFUGE RAVALLI MONTHS OF September TO December, 19 66

(1) Species	(2) Weeks of reporting period: 9/4* 1	9/11 2	9/18 3	9/25 4	10/2 5	10/9 6	10/16 7	10/23 8	10/30 9	11/6 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada			4	6	4	2	7	10	10	45
Cackling										
Brant										
White-fronted										
Snow			2		2	2	4	1	2	2
Blue										
~~Other~~ TOTAL			6	6	6	4	11	11	12	47
Ducks:										
Mallard	500	400	400	500	300	800	600	500	800	4,000
Black										
Gadwall	100	300	300	200	100	150	150	100	200	300
Baldpate	75	200	250	200	100	50	100	100	200	300
Pintail	75	100	100	50		50			50	
Green-winged teal	200	200	200	150	200	150	150	200	300	
Blue-winged teal	200	200	200	150	200	150	50			
Cinnamon teal	200	200	200	100	200	150				
Shoveler		75	50	25	25	50	50	50	50	100
Wood	250	250	300	350	300	200	100			
Redhead			2					50	40	50
Ring-necked								20	10	
Canvasback								10		
Scaup										20
Goldeneye									10	20
Bufflehead				8	6	40	40	50	50	50
Ruddy		500	250	50	10	40	40	50	100	100
~~Other~~ TOTAL	1,600	2,425	2,252	1,783	1,441	1,830	1,280	1,130	1,810	4,940
Hooded merganser	10		5	10	20	40				
Common merganser	10		10	10	10		10		10	
Red breasted "			2	10						
TOTAL	20		17	30	30	40	10		10	
Coot:	100	1,000	800	1,000	1,000	800	800	700	700	900

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE RAVALLI MONTHS OF September TO December, 1966

(1) Species	(2) Weeks of reporting period: 11/13 — 11	11/20 — 12	11/27 — 13	12/4 — 14	12/11 — 15	12/18 — 16	12/25 — 17	18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	1	1	1	1	1	1	1		49		
Trumpeter											
Geese:											
Canada	15	10		13	18	32	19		1,465		
Cackling											
Brant											
White-fronted											
Snow									105		
Blue											
~~Other~~ TOTAL	15	10		13	18	32	19		1,470		
Ducks:											
Mallard	4,000	4,000	4,000	6,000	4,700	5,200	5,000		291,900		
Black											
Gadwall	300	300	100	100	100	300	200		23,100		
Baldpate	400	200	200	400	500	500	400		29,225		
Pintail	100	100	200	100	50				6,825		
Green-winged teal	200	200	200	100	50	20	20		17,780		
Blue-winged teal									8,050		
Cinnamon teal									7,350		
Shoveler	100	50		20	50	10			4,935		
Wood									12,250		
Redhead					20				1,134		
Ring-necked						20			350		
Canvasback				50	20	20	20		840		
Scaup				100	50	100	100		2,590		
Goldeneye	50	50		50	50	100	100		3,010		
Bufflehead	50	20		50	50	50	50		3,598		
Ruddy	50			20					8,470		
~~Other~~ TOTAL	5,250	4,920	4,700	6,990	5,640	6,320	5,890		321,407		
Hooded merganser									595		
Common merganser						6	4		490		
Red breasted "									84		
Coot:	700	600	500	500	300	200	50		74,550		

(over)

(Merganser total 1,169)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	49	1	
Geese	1,470	45	
Ducks	421,407	6,000	
Coots	74,550	1,000	
Mergansers	1,169	40	

SUMMARY

Principal feeding areas Ponds and sloughs located on tracts 11, 19, 21.

Principal nesting areas Swamp, Slough Creek, assorted potholes

Reported by G. A. Devan, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ravalli Months of September thru December 1956

(1) Species Common Name	(2) First Seen Number	 Date	(3) Peak Numbers Number	 Date	(4) Last Seen Number	 Date	(5) Production Number Colonies	 Total # Nests	 Total Young	(6) Total Estimated Number
I. Water and Marsh Birds:										
Great blue heron	12 transients present from last period		22	9/30	6	still present (transient)				20
Eared grebe	12	9/8	150	9/15	7	10/9				175
Pied billed grebe	1	9/8	4	10/11	4	10/11				20
Red necked grebe	1	9/29	1	9/29						
Least grebe	2	9/29	6	10/11	6	10/11				15
Horned grebe	4	9/15	11	9/29	9	10/16				15
II. Shorebirds, Gulls and Terns:										
Killdeer	200	9/1	300	9/15	40	still present				400
Wilson's snipe	150	9/1	300	9/15	50	" "				300
Spotted sandpiper	20	9/1								
Virginia rail	20 from last per.		20	9/15	20	9/15				25
Sora rail	7	9/8	7	9/8	1	9/22				10
~~II. Shorebirds, Gulls and~~ Terns:										
Greater yellowlegs	22	9/3	49	9/15	4	10/1				60
Avocet	14	9/8	14	9/10	1	9/15				14
Semi palmated sandpiper	12	9/15	15	9/29	1	10/11				30
Black tern	10	9/15	10	9/17	10	9/17				15
California gull	8	9/15	12	9/20	2	12/19				15
Lesser yellowlegs	6	9/8	10	9/17	1	9/29				15
Least sandpiper	7	9/15	7	9/15	2	9/29				10
Sanderling	2	9/15	12	9/8	4	10/11				15
Northern phalarope	30	9/12	30	9/12	6	9/29				40
Dowitcher	4	9/17	10	9/22	6	10/28				15

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	20 from last per.		200	9/25	4	11/10		250
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	1	9/6	2	9/15	1	12/6		3 transient
Duck hawk								
Horned owl	10 from last per.		15	10/1	10 resident			20
Magpie	75 resident		350	12/1	100 still present			350
Raven	3	10/11	3	10/11	3	10/11		10
Crow	20 from last per.		100	9/15	30 still present			200
Bald eagle	1	12/6	1	12/6	1	12/6		1 transient
Red tailed hawk	1	9/2	4	10/17	2 still present			4
Swainson's hawk	1	9/29	3	10/17	1 still present			4
Sparrow hawk	30 from last per.		90	9/29	10 still present			100
Marsh hawk	8 from last per.		8	9/29	6 still present			10
Osprey	5 from last per.	transient	1	10/11	1	10/11		5
Sharp shinned hawk	1	9/15	1	9/15	1	9/15		2
Snowy owl	1	12/12			1	12/12		1

Reported by.....
G. A. Devan, Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVE

Refuge Ravalli

Season: October 8 thru January 5 Year 1966

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
Oct. 8-14	17	41	10 mallard, 6 g.w. teal, 4 coot	20	3	23	68	90
Oct. 9-15	7	15	4 mallard, 3 g.w. teal, 2 ruddy, 2 coot	11	1	12	28	50
Oct. 16-22	9	27	7 mallard, 7 g.w. teal, 6 ruddy, 2 coot, 1 snow goose	23	5	28	27	85
Oct. 23-29	18	36	6 mallard, 6 teal, 2 ruddy, 2 shoveler, 2 coot, 1 Canada goose	19	2	21	54	65
Oct. 30-Nov. 5	12	21	6 mallard, 2 widgeon, 2 g.w. teal	10	0	10	48	40
Nov. 6-12	19	56	10 mallard, 3 widgeon, 3 shoveler, 3 teal, 3 goldeneye, 1 scaup, 1 snow goose, 1 bufflehead	25	1	26	76	105
Nov. 13-19	9	14	11 mallard, 2 gadwall, 1 redhead	14	3	17	45	85
Nov. 20-26	19	22	11 mallard, 2 widgeon, 1 redhead	14	4	18	72	70
Nov.27-Dec.3	9	10	4 L. scaup, 1 mallard	5	7	12	36	50
Dec. 4-10	19	28	20 mallard, 1 b.w. teal, 1 Canada goose	22	4	26	190	260
Dec. 11-17	12	25	20 mallard, 4 g.w. teal, 2 Canada geese, 2 ruddy, 2 goldeneye	30	2	32	150	315
Dec. 18-24	15	18	17 mallard, 2 pintail	19	1	20	80	100
Dec. 25-31	18	29	16 mallard, 6 Canada geese	22	0	22	75	90
Jan. 1-5	11	33	11 mallard, 4 widgeon, 4 goldeneye, 1 coot	20	2	22	66	130

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ravalli Months of May to August, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasants	Brush, grass, agricultural 1800 acres	36			2M/1F	14			50	Some birds moved on the area during the hunting season. Probably from the east benches.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Ravalli Calendar Year 1966

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed deer	Brush, timber and grass type, 1300 acres	4					1					10	10	1M/5F
Black bear	"											2		

Remarks:

Reported by _____ Refuge Manager

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each</u> <u>species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

INT.-DUP. SEC., WASH., D.C. 59319

3-1755
Form NR-5
60701

DISEASE

Refuge Ravalli Year 1966

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks Nothing to report

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks Nothing to report

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Ravalli Year 19 66

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
White Dutch Clover	600 lbs.	R	10/66	*S	*	600 lbs.							

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: *Transferred from Kootenai Refuge. To be used next season for pasture improvement and soil stabilization.

INTERIOR--PORTLAND, OREGON

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

C.Y. 1966

Refuge Ravalli County Ravalli State Montana

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Barley	150	3110 bu.	28	715 bu.	23		228*		
								Fallow Ag. Land	

*27 acres of seeded ground sacrificed during earth work diking project.

No. of Permittees: Agricultural Operations 3 Haying Operations ____ Grazing Operations 4

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue
	-- N O N E --		
Hay - Wild			

GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
1. Cattle	212	950.93	2852.79	570
2. Other Horses	15	73.76	221.28	310
1. Total Refuge Acreage Under Cultivation				201
2. Acreage Cultivated as Service Operation				

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Ravalli Months of September through December, 1966

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Oats	80	—	80					80			80 (feed)
Barley	0	715	715					715			715 (feed)

(8) Indicate shipping or collection points

(9) Grain is stored at Work Center, tract 13

(10) Remarks Grain available for transfer to other stations for wildlife feed.

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 59323

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge Ravalli Year 1966

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
			— N ON E —					

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....

Cords.....

Ties.....

.....

INT.-DUP. SEC., WASH., D.C. 36103

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: Ravalli

Proposal Number:

Reporting Year: 1966

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/6-6/20	Scotch thistle, knapweed, annual mustards	portions of tracts 12, 13, 19	40	240	80 lbs.	2 lbs/acre	water 2 lb/ 100 gal.	spray

10. Summary of results (continue on reverse side, if necessary)

Poor results on knapweed.

INTERIOR--PORTLAND, OREGON